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RECREATION RESEARCH PROGRAM

RRP

RECREATION CARRYING CAPACITY FACTS AND CONSIDERATIONS

Report 6

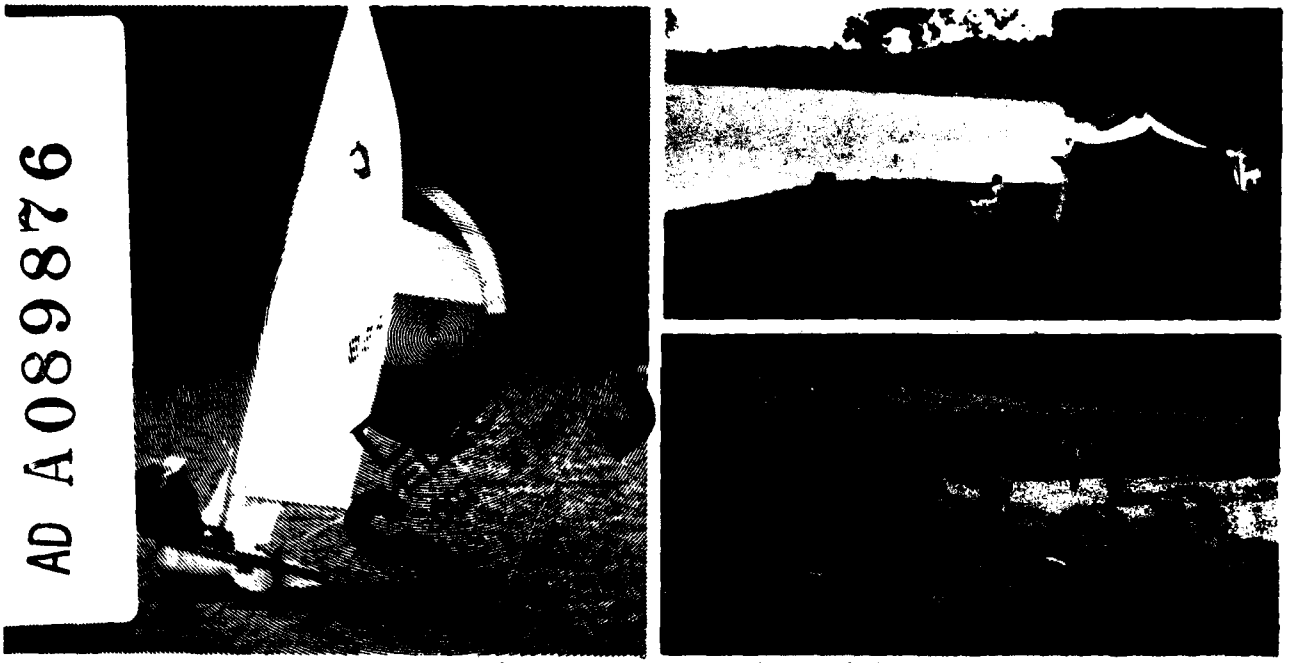
McNARY LOCK AND DAM

LAKE WALLULA PROJECT AREA

by

Urban Research and Development Corporation
528 North New Street
Bethlehem, Pa. 18018

MISCELLANEOUS PAPER R-80-1 JULY 1980 REPORT 6 OF A SERIES



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RECREATION CARRYING CAPACITY FACTS AND CONSIDERATIONS

Title	Date
Report 1: Barkley Lock and Dam, Lake Barkley Project Area	Jul 1980
Report 2: Benbrook Lake Project Area	Jul 1980
Report 3: Hartwell Lake Project Area	Jul 1980
Report 4: Lake Ouachita Project Area	Jul 1980
Report 5: Lake Shelbyville Project Area	Jul 1980
Report 6: McNary Lock and Dam, Lake Wallula Project Area	Jul 1980
Report 7: Milford Lake Project Area	Jul 1980
Report 8: New Hogan Lake Project Area	Jul 1980
Report 9: Shenango River Lake Project Area	Jul 1980
Report 10: Somerville Lake Project Area	Jul 1980
Report 11: Surry Mountain Lake Project Area	Jul 1980

Acknowledgements

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McNary Project	Recreation resource planning	
Monitoring	Recreational areas	
Overcrowding	Recreational facilities	

20. ABSTRACT (Continue on reverse side if necessary and identify by block number):

This report provides selected recreation carrying capacity-related information for the McNary Project. The information is based upon: 1) user and management surveys conducted at McNary, and 2) Urban Research and Development Corporation's observations and perceptions of the situations at the project's activity areas. The report provides information regarding activity situations, user characteristics, carrying capacity findings, and other findings; it then focuses on selected problem situations and their possible solutions.

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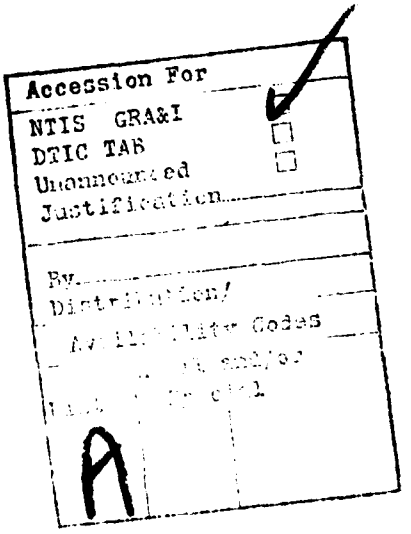
PREFACE

This report presents the findings and recommendations of the Urban Research and Development Corporation (URDC) relative to recreational carrying capacity at the McNary Lock and Dam, Lake Wallula Project Area. Results of site analyses and user surveys are presented as they relate to existing carrying capacity conditions on the project. The study was conducted under Contract with the U. S. Army Engineer Waterways Experiment Station (WES), Vicksburg, Mississippi, (Contract No. DACW39-78-C-0096).

Mr. Donald R. Detwiler, President of URDC, was Principal-In-Charge of this study, assisted by Mr. Martin C. Gilchrist, Executive Vice-President and Mr. David H. Humphrey, Vice-President. Mr. B. Thomas Palmer, Project Director, had the major responsibility for technical project direction; Messrs. Phillip D. Hunsberger and Paul L. Sabrosky were involved in the site analysis, conducting surveys, and the success analysis; and Mr. Timothy A. Fluck was involved in conducting surveys, survey analysis, and development of methodologies.

Mr. R. Scott Jackson, WES was the Project Monitor. Dr. Adolph Anderson, WES, was Program Manager of the Environmental Laboratory (EL) Recreation Research Program. The study was supervised by Dr. Conrad J. Kirby, Chief, Environmental Resources Division, EL, under the general supervision of Dr. John Harrison, Chief, EL.

COL John L. Cannon, CE, and COL Nelson P. Conover, CE, were Commanders and Directors of WES during this study. Technical Director was Mr. F. R. Brown.



CONTENTS

CONVERSION FACTORS, U. S. CUSTOMARY TO METRIC (SI)
UNITS OF MEASUREMENT

U. S. customary units of measurement used in this report can be converted to metric (SI) units as follows:

Multiply	By	To Obtain
acres	4046.856	square metres
Fahrenheit degrees	5/9	Celsuis degrees or Kelvins
feet	0.3048	metres
horsepower (550 foot and pounds per second)	745.6999	watts
inches	2.54	centimetres
miles per hour (U. S. statute)	1.609344	kilometres per hour
miles (U. S. statute)	1.609344	kilometres
square feet	0.09290304	square metres
yards	0.9144	metres

* To obtain Celsius (C) temperature readings from Fahrenheit (F) readings, use the following formula: $C = (5/9)(F - 32)$. To obtain Kelvin (K) readings, use $K = (5/9)(F - 32) + 273.15$.

PART 1: INTRODUCTION

RECREATION CARRYING CAPACITY FACTS AND CONSIDERATIONS

McNARY LOCK AND DAM, LAKE WALLULA PROJECT AREA

PART 1: INTRODUCTION

This Report

Purpose

This report, prepared as the sixth in a series of the U. S. Army Engineer Waterways Experiment Station's (WES) Recreational Carrying Capacity Design and Management Study reports, provides selected carrying capacity-related information for the McNary Lock and Dam, Lake Wallula Project Area, which is not contained in the Technical Report. The information is based upon: 1) the user and management surveys conducted at Lake Wallula, and 2) Urban Research and Development Corporation's (URDC) observations and perceptions of the situations at the project's study activity areas. Some observations and suggestions dealing with project area planning, design, and/or management are included, even though they are not specifically carrying capacity related. The report also suggests specific solutions and treatments of specific recreation activity areas.

The report first provides information regarding activity situations, user characteristics, carrying capacity findings, and other findings; it then focuses on selected problem situations and their possible solutions. Although suggestions regarding possible solutions to problems are included, this report is not intended to be a substitute for master planning or to provide answers to all project area capacity problems. Instead, this report should be viewed as a constructive, informative document which points out directions and techniques for consideration by project managers and designers in the near or distant future.

Relationship to Technical Report and Handbook

In addition to this Project Area Report and similar reports on the other ten study project areas,* the overall capacity study effort produced a Technical Report and a Capacity Handbook:

a. The Technical Report describes the overall study process, reports detailed study findings, and suggests and demonstrates methods and techniques for capacity management.

b. The Capacity Handbook is a more graphic, "how-to-do-it" type of report, designed to serve as a useful field tool for determining carrying capacity and applying techniques for capacity design and management.

This project area report is different from the Technical Report and Handbook in several ways: it includes information not found in the Technical Report and Capacity Handbook; it reports and examines user survey information by activity area and project area, rather than from the total survey population; it addresses specific problems and examines possible solutions; and it does not include the methodologies for determining and monitoring social and resource capacity. For these reasons, this report is intended to compliment the Technical Report and the Handbook, and is not intended to substitute for them.

Qualifications

The information in this report is based on the Management/Site Survey conducted on October 26-28, 1978, and the User Survey conducted on July 13-15, 1979 by Urban Research & Development Corporation (URDC) (see Appendix B). The user survey information was collected over a one-weekend period, which may or may not have been representative of a typical or heavy use weekend at McNary Lock & Dam. Interviews were limited at some activity areas because of such factors as lack of users and weather conditions. For these reasons and because carrying capacity analysis is dynamic rather than static, this report is not intended to provide the final answers. Rather, it is a foundation for future analysis and carrying capacity progress.

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* See definition of "Study Project Area" in Appendix A for a listing of these project areas.

Summary Project Area Description*

McNary Lock and Dam** is located on the Columbia River 292 miles§ from the Pacific Ocean. The project was authorized for the purposes of navigation, hydroelectric power generation, and irrigation. The Washington cities of Richland, Pasco, and Kennewick border Lake Wallula. Lake Wallula extends 64 miles upstream from the dam and represents 35,922 acres of water surface and 242 miles of shoreline at its normal pool elevation. The project area covers a total of 53,912 acres, which makes McNary the third largest project area studied. More than two-thirds of the land bounding Lake Wallula is characterized by steep, rugged basalt formations. In some places, bluffs rise abruptly from the shoreline; in other places, the topography at the shoreline is gently sloping. The climate of the area is arid; precipitation averages only six inches annually. Summer temperatures average near 90 degrees F. (with extremes to over 110 degrees F.). Trees are scarce and the vegetative cover is sparse, consisting of mainly grasses, sagebrush, forbs, and low shrubs.

The upper and lower ends and the eastern portions of the project are accessible via adjacent highways. However, much of the lake's eastern and western shoreline is not accessible due to high canyon-like cliffs at the water's edge. The project's recreation facilities serve visitors from a very large area encompassing northern Oregon and southeastern Washington. Visitation in 1978 was 4.5 million recreation days. (See Appendix C for a more detailed project area description.)

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* Appendix C contains a more detailed project area description for your future use.

** See map inside back cover.

§ A table of factors for converting U. S. customary units of measurement to metric (SI) units is found on page iv.

PART 2: SURVEY FINDINGS BY ACTIVITY

BOATING/WATERSKIING

Orientation

Boating and waterskiing are popular at McNary, especially on the Snake River area adjacent to Hood Park and the lower portion of Lake Wallula between the dam and McNary Beach. On most of Lake Wallula, power boating is almost totally contained on the Columbia River proper, which can sustain present use. Frequent water fluctuation occurs (3-4 feet) daily and many shallow areas are unusable during the low water periods. Like most other project areas, there are sometimes nodal crowding problems and conflicts between recreational boaters and other lake users (i.e., boat fishermen and swimmers).

The findings presented in the remainder of this section are based on the User Survey. This survey obtained 32 responses from boaters and waterskiers at McNary.

User characteristics

Table 1 indicates the characteristics of the boaters and waterskiers surveyed at McNary. The most significant differences in the characteristics of the boaters and waterskiers surveyed at McNary from those of other study project areas are: the large number of groups of nine or more people, and the large number coming from nearby areas.

Table 1

Boater/Waterskier Characteristics

Age	Percent of Boaters/Waterskiers	Group Size	Percent of Boaters/Waterskiers
<18	3	1	0
18 - 25	22	2	16
26 - 40	56	3 - 4	34
41 - 55	16	5 - 8	25
56 - 65	0	9 - 12	13*
>65	0	>12	13*

Travel Time to Project Area	Percent of Boaters/Waterskiers	Visit Duration	Percent of Boaters/Waterskiers
<15 minutes	25*	1 - 4 hours	6
15 - 30 minutes	44*	5 - 8 hours	78
30 - 60 minutes	13	1 day	3
1 - 2 hours	16	2 days	6
2 - 3 hours	0	3 days	6
3 - 5 hours	3	4 days	0
>5 hours	0	5 - 7 days	0
		>7 days	0

No. of Other Activities	Percent of Boaters/Waterskiers	Equipment	Percent of Boaters/Waterskiers
0	3	Sailboat	0
1	19	Canoe	3
2	16	Power Boat	
3	12	(<25 h.p.)	6
4	44	Power Boat	
5	6	(>25 h.p.)	90
6	0		
>6	0		

*Significantly higher than total survey sample.

User opinions

Spacing preferences - Tables 2 and 3 indicate the spacing that the boaters and waterskiers surveyed at McNary and elsewhere prefer.

Table 2

Preferred Distance Responses*

Sample	Sample Size	Range	Mean	Median	Mode
All Boaters Surveyed	135	30- a	531	300	300
McNary/Lake Wallula	18	15-1800	476	300	300
All Waterskiers Surveyed	95	30- a	520	300	300
McNary/Lake Wallula	8	100- a	286	300	300

*In feet; see Appendix A for definitions of terms.
a - response of "alone" or "out of sight."

Table 3

Preferred Distance Responses in Planning Range and Preference Groupings*

Sample	% in Planning Range[1] (100'-1500')	% in A[2] (100'-199')	% in B[2] (200'-450')	% in C[2] (451'-1500')
All Boaters Surveyed	79%	29%	37%	34%
McNary/Lake Wallula	89	19	50	31
Sample	**% in Planning Range[1] (100'-1500')**	**% in A[2] (100'-199')**	**% in B[2] (200'-400')**	**% in C[2] (401'-1500')**
All Waterskiers Surveyed	91%	22%	50%	28%
McNary/Lake Wallula	88	14	57	29

*See Appendix A for definitions of terms; see Technical Report for a full development of spacing preference information.

[1]Percentage of all preferred distance responses.

[2]Percentage of all preferred distance responses in the Planning Range.

The distributions of preferred spacing of both boaters and waterskiers at McNary are relatively similar to those of the total survey.

Reasons for pleasant/unpleasant experience - Table 4 indicates the impact that different factors had on making the boating or waterskiing experience pleasant or unpleasant for users at McNary. The "amount/convenience of the facilities" and "noise" were the factors which most often made the experience at McNary unpleasant. None of the boaters or waterskiers surveyed indicated that they would not return to the lake.

Tables 5 and 6 indicate the changes in the physical condition and people's use of the area reported by boaters and waterskiers from their previous visit.

Table 5

Positive and Negative Changes Noticed in the Physical Conditions of the Area - Items Mentioned by Boaters and Waterskiers

Area	Positive Changes	Negative Changes
Lake and Adjacent Areas	"Addition of levee (new boat ramp)" (1)	"Too much water fluctuation" (1)
	"Park nicer" (1)	"Launch ramp too small--need at least 3 or 4" (1)
	"General improvement" (1)	"Need more parking" (1)
	"Better water" (1)	

NOTE: The number in parenthesis (#) indicates the number of times the change was mentioned.

Table 6

Positive and Negative Changes Noticed in the People's Use of the Area - Items Mentioned by Boaters and Waterskiers

Area	Positive Changes	Negative Changes
Lake and Adjacent Areas	"Less rowdy" (1)	"Littering" (1)
		"More crowded" (4)

NOTE: The number in parenthesis (#) indicates the number of times the change was mentioned.

Table 4

Reasons Making Recreation Experience Pleasant or Unpleasant--Boating/Waterskiing
McNary Dam

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	84	16	-
Distance from other people	78	19	3
Number of people in other visitor groups	44	9	47
Number and type of other activities occurring here	91	3	6
Scenic views	91		9
Noise	44	22	34
Accidents or near accidents	81	19	-
Enforcement of rules/regulations	94	6	-
Car parking facilities	94	6	-
Theft	100	-	-
Vandalism	100	-	-
Land-Based Reasons			
Amount of facilities (restrooms, water, etc.)	69	22	9
Convenience to facilities (restrooms, water, etc.)	75	22	3
Maintenance of facilities	97	3	-
Condition of trees and landscape	100	-	-
Condition of grass or soil	97	3	-
Water-Based Reasons			
Water quality	91	9	-
Formal designation of places for your activity	16	-	-
Waiting time to launch boat	84	-	-
People in areas they shouldn't be	94	3	-

*Percentages may not total 100% because of those responding "Does Not Apply."

Acceptability of techniques - Table 7 indicates the acceptability of different techniques for solving problems to the boaters and water-skiers surveyed at McNary.

The acceptability of most techniques is very clear: at least 60 percent of the respondents agreed on one of the 3 levels of acceptability for 11 of the 11 techniques. But even for those techniques which most respondents found to be acceptable, up to 44 percent found them to be unacceptable. Thus, project management should expect some opposition to any technique used.

In general, the more apparent and widespread that a problem of overcrowding or overuse is, the more likely users may accept a technique which addresses it. Thus, remedial techniques (which solve existing problems) are generally more acceptable than preventative techniques (which correct a problem before it becomes readily apparent.

The more users can understand the rationale and operation of a technique, the more likely they will accept the use of the technique. Education, therefore, would seem to be an important method of improving user acceptance of different techniques.

It also seems as though the more directly a technique impacts only the problem, and the less it operates to diminish recreational opportunities generally, the more likely users will accept the use of the technique. Thus, techniques which can be applied in the short-term or selectively to problem areas are favored (particularly if done in a crisis setting).

Techniques which call for reductions in existing opportunities to use recreational resources and facilities are strongly disfavored. User expectations of the opportunities available are critical in this determination. Consideration should be given initially to avoiding overdeveloping an area with the idea that selective cutbacks in services and facilities can be accomplished later. Users expectations will be based on the initial level, and subsequent reductions will be disfavored.

Table 7

User Acceptability of Techniques--Boating/Waterskiing
McNary Dam

Techniques	Levels of Acceptability Percentage* of Users Responding:		
	Very Acceptable	Mildly Acceptable	Unacceptable
General Planning Techniques			
Keep major recreation areas more separated	36	19	44
Make vehicle access to areas less convenient	3	3	94
Make area's existence less obvious	9	9	81
Site Planning Techniques			
Design for greater distance between people	3	9	13
Reduce number of parking spaces	59	25	16
Management Techniques			
Procedures:			
Require prior reservations	6	19	75
Require permits	16	31	53
Charge/increase fees	13	7	80
Rules and Regulations:			
Impose more rules	13	13	75
Provide stricter enforcement of rules	56	9	28
Close areas when natural resource destruction reaches critical point	75	16	9
Close areas when they become "too full"	69	17	14
Reduce number of activities in same area	31	22	44
Keep unnecessary vehicles out	72	9	19
Services:			
Provide more and better information	78	13	9
Increase maintenance and restoration	75	13	-
Reduce facilities and services	3	6	91

*Percentages may not total 100% because of those responding "Does Not Apply."

BOAT LAUNCHING

Orientation

The launching ramp at Hook Park is overcrowded and there are no individually designated spaces for vehicles and boat trailers. Other problems exist at this launching area: the ramp itself is too short and not quite wide enough for two launchers to easily use at the same time; there is a parking shortage, the water is shallow, there are few circulation controls to expedite flow. A new and better designed ramp is being constructed nearby in deeper water to solve these problems. The boat launching facility located between McNary Dam and McNary Beach lacks individually designated parking spaces for boat trailers. The Corps is planning to upgrade this facility.

The findings presented in the remainder of this section are based on the User Survey. This survey obtained 28 responses from boat launchers at McNary.

User characteristics

Table 8 indicates the characteristics of the boat launchers surveyed at McNary.

Table 8

Boat Launching Characteristics

Age	Percent of Boat Launchers
<18	4
18 - 25	22
26 - 40	56
41 - 55	19
56 - 65	0
>65	0

Group Size	Percent of Boat Launchers
1	0
2	4
3 - 4	43
5 - 8	36
9 - 12	11
>12	7

Travel Time to Project Area	Percent of Boat Launchers
<15 minutes	36
15 - 30 minutes	43
30 - 60 minutes	14
1 - 2 hours	7
2 - 3 hours	0
3 - 5 hours	0
>5 hours	0

Visit Duration	Percent of Boat Launchers
1 - 4 hours	0
5 - 8 hours	86
1 day	0
2 days	6
3 days	0
4 days	0
5 - 7 days	6
>7 days	7

No. of Other Activities	Percent of Boat Launchers
0	14
1	14
2	14
3	14
4	36
5	0
6	7
>6	0

User opinions

Launch time preferences - Table 9 indicates the launch times that boat launchers at McNary and elsewhere prefer.

Table 9

Preferred Launch Time Responses*

Sample	Sample Size	Range	Mean
McNary	25	0 - 15 min.	6 min.
Hood Park	23	0 - 15 min.	6 min.
McNary Dam	2	5 min.	5 min.

*In minutes; See Appendix A for definitions of terms.

Reasons for pleasant/unpleasant experience - Tables 10 and 11 indicate the impact that different factors had on making the boat launching experience pleasant or unpleasant for users at the two areas surveyed. The "amount of facilities" and "convenience to the facilities" were the factors which most often made the experience at McNary unpleasant. None of the boat launchers indicated that they would not return.

Table 10

Reasons Making Recreation Experience Pleasant or Unpleasant--Boat Launching
McNary Dam

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	100	-	-
Distance from other people	100	-	-
Number of people in other visitor groups	100	-	-
Number and type of other activities occurring here	100	-	-
Scenic views	100	-	-
Noise	100	-	-
Accidents or near accidents	100	-	-
Enforcement of rules/regulations	100	-	-
Car parking facilities	100	-	-
Theft	100	-	-
Vandalism	100	-	-
Land-Based Reasons			
Amount of facilities (restrooms, water, etc.)	50	50	-
Convenience to facilities (restrooms, water, etc.)	50	50	-
Steepness of slopes	100	-	-
Maintenance of facilities	100	-	-
Condition of trees and landscape	100	-	-
Condition of grass or soil	100	-	-
Water-Based Reasons			
Water quality	100	-	-
Formal designation of places for your activity	0	0	0
Waiting time to launch boat	100	-	-
People in areas they shouldn't be	100	-	-

*Percentages may not total 100% because of those responding "Does Not Apply."

Table 11

Reasons Making Recreation Experience Pleasant or Unpleasant--Boat Launching
Hood Park

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	96	4	-
Distance from other people	73	8	15
Number of people in other visitor groups	65	-	35
Number and type of other activities occurring here	85	4	12
Scenic views	88	4	8
Noise	77	8	15
Accidents or near accidents	96	4	-
Enforcement of rules/regulations	100	-	-
Car parking facilities	81	19	-
Theft	100	-	-
Vandalism	100	-	-
Land-Based Reasons			
Amount of facilities (restrooms, water, etc.)	65	31	4
Convenience to facilities (restrooms, water, etc.)	73	27	-
Steepness of slopes	96	4	-
Maintenance of facilities	100	-	-
Condition of trees and landscape	100	-	-
Condition of grass or soil	100	-	-
Water-Based Reasons			
Water quality	92	8	-
Formal designation of places for your activity	27	-	-
Waiting time to launch boat	85	-	-
People in areas they shouldn't be	96	-	-

*Percentages may not total 100% because of those responding "Does Not Apply."

Tables 12 and 13 indicate the changes in the physical condition and people's use of Hood Park reported by boat launchers from their previous visit. No changes were reported by the launchers surveyed at McNary Dam.

Table 12

Positive and Negative Changes Noticed in the Physical Conditions of the Area - Items Mentioned by Boat Launchers

Area	Positive Changes	Negative Changes
Hood Park	"Overall nicer" (2) "Filled" (1) "Cleaned up beach" (1)	"Too much water fluctuation" (1)

NOTE: The number in parenthesis (#) indicates the number of times the change was mentioned.

Table 13

Positive and Negative Changes Noticed in the People's Use of the Area - Items Mentioned by Boat Launchers

Area	Positive Changes	Negative Changes
Hood Park	(None mentioned)	"More boaters" (1)

NOTE: The number in parenthesis (#) indicates the number of times the change was mentioned.

Acceptability of techniques - Table 14 indicates the acceptability of different techniques for solving problems to the boat launchers surveyed at McNary.

The acceptability of most techniques is very clear: at least 60 percent of the respondents agreed on one of the 3 levels of acceptability for 13 of the 18 techniques. But even for those techniques which most respondents found to be acceptable, up to 39 percent found them to be unacceptable. Thus, project management should expect some opposition to any technique used.

Table 14

User Acceptability of Techniques--Boat Launching
McNary Dam

Techniques	Levels of Acceptability Percentage* of Users Responding:		
	Very Acceptable	Mildly Acceptable	Unacceptable
General Planning Techniques			
Keep major recreation areas more separated	46	14	39
Make vehicle access to areas less convenient	4	11	86
Make area's existence less obvious	4	4	93
Site Planning Techniques			
Redesign area to accommodate fewer users			
Design for greater distance between people	7	4	21
Reduce number of parking spaces	50	25	25
Management Techniques			
Procedures:			
Require prior reservations	-	18	82
Require permits	7	18	75
Charge/increase fees	4	25	71
Rules and Regulations:			
Impose more rules	14	29	57
Provide stricter enforcement of rules	71	10	18
Close areas when natural resource destruction reaches critical point	79	7	14
Close areas when they become "too full"	64	21	14
Reduce number of activities in same area	50	18	32
Limit number of people in visitor groups	4	-	68
Keep unnecessary vehicles out	86	4	11
Services:			
Provide more and better information	81	19	-
Increase maintenance and restoration	68	25	4
Reduce facilities and services	-	-	100

*Percentages may not total 100% because of those responding "Does Not Apply."

CAMPING

Orientation

The study camping areas include: the Hood Park and Madame Dorian Park campgrounds. Hood Park campground, once overcrowded and overused, is now a well balanced, successful fee camping area. The campground was regraded and redesigned with paved pads, and made more attractive by underground utilities and landscaping. The irrigation system has allowed the establishment of attractive lawn areas adjacent to the asphalt camp pads in spite of the arid climate.

Madame Dorian Park has approximately 25 less developed campsites (undesignated). It is a free area located directly adjacent to a major highway. The park is sometimes overcrowded and some overuse can be seen.

The findings presented in the remainder of this section are based on the User Survey. This survey obtained 35 responses from campers at McNary (9 at Madame Dorian and 26 at Hood Park).

User characteristics

Table 15 indicates the characteristics of the campers surveyed at McNary.

Table 15

Camper Characteristics

Age	Percent of Campers
<18	0
18 - 25	6
26 - 40	36
41 - 55	33
56 - 65	25
>65	0

Group Size	Percent of Campers
1	0
2	46
3 - 4	26
5 - 8	23
9 - 12	0
>12	6

Travel Time to Project Area	Percent of Campers
<15 minutes	6
15 - 30 minutes	14
30 - 60 minutes	19
1 - 2 hours	25
2 - 3 hours	6
3 - 5 hours	8
>5 hours	22

Visit Duration	Percent of Campers
1 - 4 hours	3
5 - 8 hours	0
1 day	11
2 days	28
3 days	6
4 days	11
5 - 7 days	17
>7 days	25

No. of Other Activities	Percent of Campers
0	25
1	25
2	28
3	8
4	3
5	8
6	3
>6	0

Equipment	Percent of Campers
Tent	8
Tent Camper	3
Truck-mounted Camper	14
Travel Trailer	61
Motor Home	14

*Significantly higher than total survey sample.
**Significantly lower than total survey sample.

User opinions

Spacing preferences - Tables 16 and 17 indicate the spacing (as measured on center of each site) that campers surveyed at McNary and elsewhere prefer.

Table 16

Preferred Distance Responses* - Camping

Sample	Sample Size	Range	Mean	Median	Mode
All Campers Surveyed (11 projects)	511	10 - a	79	60	75
McNary	27	10 - a	41	75	75
Hood Park	20	10 - a	42	75	75
Madame Dorian	7	25 - a	39	40	50

*in feet; See Appendix A for definitions of terms.
a - response of "alone" or "out of sight."

Table 17

Preferred Distance Responses in Planning Range and Preference Groupings*

Sample	% in Planning Range[1] (20'-120')	% in A[2] (20'-39')	% in B[2] (40'-59')	% in C[2] (60'-79')	% in D[2] (80'-120')
All Campers Surveyed	90%	20%	28%	31%	21%
McNary	85	13	30	57	0
Hood Park	80	0	19	81	0
Madame Dorian	100	43	57	0	0

*See Appendix A for definitions of terms; See Technical Report for full development of spacing preference information.
[1]Percentage of all preferred distance responses.
[2]Percentage of all preferred distance responses within the Planning Range.

Spacing in the range of group D (80'-120' feet) is greatly disfavored by the campers surveyed at McNary.

Reasons for pleasant/unpleasant experience - Tables 18 and 19 indicate the impact that different factors had on making the camping experience pleasant or unpleasant for users at the two areas surveyed. "Amount of facilities" was the factor which most often made the experience at Wood Park unpleasant. "Maintenance/convenience of facilities" were the factors which most often made the experience at Madame Dorian unpleasant. None of the campers surveyed indicated they would not return.

Tables 20 and 21 indicate the changes in the physical conditions and people's use of the areas reported by campers from their previous visit.

Table 18

Reasons Making Recreation Experience Pleasant or Unpleasant--Camping
Hood Park

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	92	4	4
Distance from other people	100	-	-
Number of people in other visitor groups	73	8	19
Number and type of other activities occurring here	81	19	-
Fees charged	100	-	-
Scenic views	100	-	-
Noise	96	-	4
Accidents or near accidents	92	4	-
Enforcement of rules/regulations	96	4	-
Car parking facilities	85	15	-
Theft	85	12	-
Vandalism	96	-	-
Land-Based Reasons			
Visual privacy from other people	88	12	-
Amount of facilities (restrooms, water, etc.)	65	35	-
Convenience to facilities (restrooms, water, etc.)	92	8	-
Nearness to the water body	100	-	-
Steepness of slopes	96	4	-
Maintenance of facilities	100	-	-
Condition of trees and landscape	100	-	-
Condition of grass or soil	100	-	-
Water-Based Reasons			
Water quality	76	12	8

*Percentages may not total 100% because of those responding "Does Not Apply."

Table 19

Reasons Making Recreation Experience Pleasant or Unpleasant--Camping
Madame Dorian

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	89	11	-
Distance from other people	100	-	-
Number of people in other visitor groups	22	33	44
Number and type of other activities occurring here	56	11	33
Fees charged	(Not Applicable)		
Scenic views	89	-	-
Noise	100	-	-
Accidents or near accidents	100	-	-
Enforcement of rules/regulations	100	-	-
Car parking facilities	100	-	-
Theft	100	-	-
Vandalism	100	-	-
Land-Based Reasons			
Visual privacy from other people	89	11	-
Amount of facilities (restrooms, water, etc.)	78	22	-
Convenience to facilities (restrooms, water, etc.)	56	44	-
Nearness to the water body	67	33	-
Steepness of slopes	78	22	-
Maintenance of facilities	44	56	-
Condition of trees and landscape	100	-	-
Condition of grass or soil	67	33	-
Water-Based Reasons			
Water quality	67	11	-

*Percentages may not total 100% because of those responding "Does Not Apply."

Table 20

Positive and Negative Changes Noticed in the Physical Conditions of the Area - Items Mentioned by Campers

Area	Positive Changes	Negative Changes
Hood Park	"Bigger" (1)	"Poor boating facilities" (1)
	"More maintenance" (1)	"More workers--more non-recreationists taking up sites" (2)
	"Pretty now" (1)	"Should trim trees on entrance way" (1)
	"More grills" (1)	"Flies from swamp are bad" (1)
	"Campsites" (3)	"Houses built up around park" (1)
	"Better electricity" (2)	"Dogs" (1)
	"Bathrooms" (2)	"Gate locked at night" (1)
	"A lot greener" (3)	"Full hook-ups" (1)
	"Facilities" (1)	"Grass is not as green as last year" (1)
	"Landscaping" (1)	
	"Cleaning up the beach" (1)	
Madame Dorian	"Fixed roads (wider)" (1)	"Water fluctuations" (1)
	"Mosquito control" (1)	"Restrooms dirtier" (1)
	"Bigger park" (1)	
	"Water/sewer" (1)	
	"Dump station" (1)	

NOTE: The number in parenthesis (#) indicates the number of times the change was mentioned.

Table 21

Positive and Negative Changes Noticed in the People's Use of the Area - Items Mentioned by Campers

Area	Positive Changes	Negative Changes
Hood Park	"Well balanced - a lot of pet though" (1)	"Kids riding around" (1)
	"Rangers patrol more" (1)	"Bathrooms" (1)
		"Dogs not leashed" (1)
		"Skate boarders" (1)
Madame Dorian	(None mentioned)	"Not clean--litter" (1)

NOTE: The number in parenthesis (#) indicates the number of times the change was mentioned.

Acceptability of techniques - Table 22 indi ates the acceptability of different techniques for solving problems to the campers surveyed at McNary.

The acceptability of most techniques is very clear: at least 60 percent of the respondents agreed on one of the 3 levels of acceptability for 13 of the 22 techniques. But even for those techniques which most respondents found to be acceptable, up to 44 percent found them to be unacceptable. Thus, project management should expect some opposition to any technique used.

Table 22

User Acceptability of Techniques--Camping
McNary Dam

Techniques	Levels of Acceptability Percentage* of Users Responding:		
	Very Acceptable	Mildly Acceptable	Unacceptable
General Planning Techniques			
Keep major recreation areas more separated	50	17	22
Make vehicle access to areas less convenient	17	14	69
Make area's existence less obvious	11	17	67
Site Planning Techniques			
Redesign area to accommodate fewer users	42	8	50
Design for greater distance between people	42	17	42
Reduce number of parking spaces	28	8	64
Change natural surface by hardening	71		29
Change natural surface by paving	31	25	44
Provide landscaped buffers	56	19	25
Management Techniques			
Procedures:			
Require prior reservations	22	8	70
Require permits	23	9	69
Charge/increase fees	6	42	53
Rules and Regulations:			
Impose more rules	9	3	89
Provide stricter enforcement of rules	44	14	42
Close areas when natural resource destruction reaches critical point	83	8	8
Close areas when they become "too full"	69	3	28
Reduce number of activities in same area	33	25	38
Limit number of people in visitor groups	25	14	61
Keep unnecessary vehicles out	67	11	22
Services:			
Provide more and better information	69	19	11
Increase maintenance and restoration	50	33	11
Reduce facilities and services	6	3	92

*Percentages may not total 100% because of those responding "Does Not Apply."

HIKING

Orientation

The recently built Wildlife Park Trail is an interpretive trail. It is 3/4 mile long, 3-4 feet wide and meanders through a variety of wildlife habitats. It has a gravel surface (somewhat noisy). Camera blinds are located at several places along the trail. Only a few hikers could be found using the trail during the User Survey.

The findings presented in the remainder of this section are based on the User Survey. This survey obtained 3 responses from hikers at the Wildlife Park Trail.

User characteristics

Table 23 indicates the characteristics of the hikers surveyed at McNary.

Table 23

Hiker Characteristics

Age	Percent of Hikers	Group Size	Percent of Hikers
<18	100	1	0
18 - 25	0	2	33
26 - 40	0	3 - 4	33
41 - 55	0	5 - 8	33
56 - 65	0	9 - 12	0
>65	0	>12	0

Travel Time to Project Area	Percent of Hikers	Visit Duration	Percent of Hikers
<15 minutes	33	1 - 4 hours	100
15 - 30 minutes	33	5 - 8 hours	0
30 - 60 minutes	0	1 day	0
1 - 2 hours	0	2 days	0
2 - 3 hours	0	3 days	0
3 - 5 hours	0	4 days	0
>5 hours	33	5 - 7 days	0
		>7 days	0

No. of Other Activities	Percent of Hikers
0	100
1	0
2	0
3	0
4	0
5	0
6	0
>6	0

User opinions

Spacing preferences - The preferred spacing responses of the three hikers surveyed at McNary ranged from 150' to "out of sight" while the average spacing was 225 feet.

Reasons for pleasant/unpleasant experience - Table 24 indicates the impact that different factors had on making the hiking experience pleasant or unpleasant for users at the Wildlife Park Trail. The "amount/convenience of facilities" were the factors which most often made the hiking experience at McNary unpleasant. None of the hikers indicated they would not return to the area.

Table 25 indicates the changes in the physical condition of the area reported by hikers from their previous visit. No changes in people's use of the area were reported.

Table 24

Reasons Making Recreation Experience Pleasant or Unpleasant--Hiking Wildlife Park Trail

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	100	-	-
Distance from other people	100	-	-
Number of people in other visitor groups	100	-	-
Number and type of other activities occurring here	0	0	0
Fees charged			
Scenic views	100	-	-
Noise	100	-	-
Accidents or near accidents	100	-	-
Enforcement of rules/regulations	100	-	-
Car parking facilities	100	-	-
Theft	100	-	-
Vandalism	100	-	-
Land-Based Reasons			
Visual privacy from other people	100	-	-
Amount of facilities (restrooms, water, etc.)	33	67	-
Convenience to facilities (restrooms, water, etc.)	33	67	-
Nearness to the water body	100	-	-
Steepness of slopes	100	-	-
Maintenance of facilities	100	-	-
Condition of trees and landscape	100	-	-
Condition of grass or soil	100	-	-
Water-Based Reasons			
Water quality	100	-	-

*Percentages may not total 100% because of those responding "Does Not Apply."

Table 25

Positive and Negative Changes Noticed in the Physical Conditions of the Area - Items Mentioned by Hikers

Area	Positive Changes	Negative Changes
Wildlife Park Trail	"Photo blinds" (1) "More trail" (1)	"Starting to get over-grown" (1)

NOTE: The number in parenthesis (#) indicates the number of times the change was mentioned.

Acceptability of techniques - Table 26 indicates the acceptability of different techniques for solving problems to the hikers surveyed at McKerr.

The acceptability of most techniques is very clear: at least 60 percent of the respondents agreed on one of the 3 levels of acceptability for 19 of the 21 techniques. But even for those techniques which most respondents found to be acceptable, up to 33 percent found them to be unacceptable. Even project management should expect some opposition to any technique used.

Table 26

User Acceptability of Techniques-- Hiking
McNary Dam

Techniques	Levels of Acceptability Percentage* of Users Responding:		
	Very Acceptable	Mildly Acceptable	Unacceptable
General Planning Techniques			
Keep major recreation areas more separated	67	-	33
Make vehicle access to areas less convenient	-	-	100
Make area's existence less obvious	-	-	100
Site Planning Techniques			
Redesign area to accommodate fewer users	-	67	33
Design for greater distance between people	67	-	33
Reduce number of parking spaces	100	-	-
Change natural surface by hardening	-	-	-
Change natural surface by paving	100	-	-
Provide landscaped buffers	67	33	-
Management Techniques			
Procedures:			
Require prior reservations	-	-	100
Require permits	-	-	100
Charge/increase fees	33	-	67
Rules and Regulations:			
Impose more rules	33	33	33
Provide stricter enforcement of rules	100	-	-
Close areas when natural resource destruction reaches critical point	100	-	-
Close areas when they become "too full"	33	33	33
Reduce number of activities in same area	67	-	33
Limit number of people in visitor groups	67	-	33
Keep unnecessary vehicles out	100	-	-
Services:			
Provide more and better information	67	33	-
Increase maintenance and restoration	100	-	-
Reduce facilities and services	100	-	-

*Percentages may not total 100% because of those responding "Does Not Apply."

PICNICKING

Orientation

Picnicking at Hood Park is very popular. During the User Survey the parking areas filled up and the area was full, but not overcrowded. Perhaps more parking could be added, as well as more cooking grills. The movable picnic tables seem to work well in reducing overcrowding and overuse problems. The tables are moved to achieve preferred distances and groupings, and by moving tables the amount of resource wear is evenly distributed through the area.

The findings presented in the remainder of this section are based on the User Survey. This survey obtained 39 responses from picnickers at Hood Park.

User characteristics

Table 27 indicates the characteristics of the picnickers surveyed at Hood Park.

Table 27

Picnicker Characteristics

Age	Percent of Picnickers	Group Size	Percent of Picnickers
<18	5	1	3
18 - 25	15	2	5
26 - 40	69	3 - 4	26
41 - 55	8	5 - 8	33
56 - 65	3	9 - 12	10
>65	0	>12	23

Travel Time to Project Area	Percent of Picnickers	Visit Duration	Percent of Picnickers
<15 minutes	31	1 - 4 hours	31
15 - 30 minutes	36	5 - 8 hours	67
30 - 60 minutes	15	1 day	2
1 - 2 hours	13	2 days	0
2 - 3 hours	3	3 days	0
3 - 5 hours	0	4 days	0
>5 hours	0	5 - 7 days	0
		>7 days	0

No. of Other Activities	Percent of Picnickers
0	3
1	8
2	59
3	15
4	13
5	0
6	0
>6	2

User opinions

Spacing preferences - Tables 28 and 29 indicate the spacing that picnickers surveyed at Hood Park and elsewhere prefer.

Table 28

Preferred Distance Responses*

Sample	Sample Size	Range	Mean	Median	Mode
All Picnickers Surveyed	190	1 - a	62	50	50
McNary, Hood Park	28	30 - 2	73	55	100

*In feet; See Appendix A for definitions of terms.
a - response of "alone" or "out of sight."

Table 29

Preferred Distance Responses in Planning Range and Preference Groupings*

Sample	% in Planning Range[1] (20'-100')	% in A[2] (20'-39')	% in B[2] (40'-59')	% in C[2] (60'-79')	% in D[2] (80'-100')
All Picnickers surveyed	93%	23%	42%	20%	15%
McNary, Hood Park	96	19	38	12	31

*See Appendix A for definitions of terms; See Technical Report for a full development of spacing preference information.

[1]Percentage of all preferred distance responses.
[2]Percentage of all preferred distance responses in the Planning Range.

Reasons for pleasant/unpleasant experience - Table 30 indicates the impact that different factors had on making the picnic experience pleasant or unpleasant for users at Hood Park. "Car parking facilities," "scenic views" and "noise" were the factors which most often made the experience at Hood Park unpleasant. None of the picnickers surveyed indicated that they would not return.

Tables 31 and 32 indicate the changes in the physical condition and people's use of the area reported by picnickers from their previous visit.

Table 30

Reasons Making Recreation Experience Pleasant or Unpleasant--Picnicking
Hood Park

	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons Characteristics and behavior of other people	87	-	13
Distance from other people	87	3	10
Number of people in other visitor groups	38	3	56
Number and type of other activities occurring here	84	-	16
Scenic views	82	13	5
Noise	77	13	10
Accidents or near accidents	92	3	5
Enforcement of rules/regulations	82	8	5
Car parking facilities	86	14	-
Theft	87	3	-
Vandalism	82	5	-
Land-Based Reasons Visual privacy from other people	54	-	41
Amount of facilities (restrooms, water, etc.)	87	8	3
Convenience to facilities (restrooms, water, etc.)	82	12	3
Nearness to the water body	95	-	5
Steepness of slopes	85	-	10
Maintenance of facilities	92	5	-
Condition of trees and landscape	100	-	-
Condition of grass or soil	89	11	-
Water-Based Reasons Water quality	87	10	-

*Percentages may not total 100% because of those responding "Does Not Apply."

Table 31

Positive and Negative Changes Noticed in the Physical Conditions of the Area - Items Mentioned by Picnickers

Area	Positive Changes	Negative Changes
Hood Park	"Nicer grass" (3) "Better facilities (rest-rooms)" (1) "More shade trees" (1) "Well kept park" (1) "Cleaner" (5) "Moved swimming away from skiers" (1) "Showers in camping area" (2) "Electricity" (1) "Like all the roads for skateboarding" (1) "Swimming beach nicer" (1) "More barbeque pits" (1) "Like swimming roped-off close and convenient" (1) "Larger swimming area" (1) "Landing improved" (1) "Less trouble" (1)	"Too much water" (1) "A lot of flies" (1) "Bigger and more crowded" (1) "Moved dock closer to land" (1) "No beer drinking" (1) "Drier grass" (1)

NOTE: The number in parenthesis (#) indicates the number of times the change was mentioned.

Table 32

Positive and Negative Changes Noticed in the People's Use of the Area - Items Mentioned by Picnickers

Area	Positive Changes	Negative Changes
Hood Park	"Most are family people" (1) "All pretty friendly" (2) "Less rowdy" (1)	"People and their dogs" (1) "Migrants during crop season" (1) "Littering" (1)

NOTE: The number in parenthesis (#) indicates the number of times the change was mentioned.

Acceptability of techniques - Table 33 indicates the acceptability of different techniques for solving problems to the picnickers surveyed at Hood Park.

The acceptability of most techniques is very clear: at least 60 percent of the respondents agreed on one of the 3 levels of acceptability for 12 of the 21 techniques. But even for those techniques which most respondents found to be acceptable, up to 46 percent found them to be unacceptable. Thus, project management should expect some opposition to any technique used.

Table 33

User Acceptability of Techniques--Picnicking
McNary Dam

Techniques	Levels of Acceptability Percentage* of Users Responding: Very Acceptable	Mildly Acceptable	Unacceptable
General Planning Techniques			
Keep major recreation areas more separated	54	15	26
Make vehicle access to areas less convenient	18	18	64
Make area's existence less obvious	13	15	72
Site Planning Techniques			
Redesign area to accommodate fewer users	28	13	59
Design for greater distance between people	49	18	31
Reduce number of parking spaces	35	19	46
Change natural surface by paving	10	10	77
Provide landscaped buffers	44	23	31
Management Techniques			
Procedures:			
Require prior reservations	10	-	90
Require permits	8	23	69
Charge/increase fees	18	44	38
Rules and Regulations:			
Impose more rules	8	10	82
Provide stricter enforcement of rules	38	15	46
Close areas when natural resource destruction reaches critical point	79	18	3
Close areas when they become "too full"	67	10	23
Reduce number of activities in seam area	33	21	46
Limit number of people in visitor groups	10	3	85
Keep unnecessary vehicles out	59	15	18
Services:			
Provide more and better information	90	5	3
Increase maintenance and restoration	67	21	10
Reduce facilities and services	3	5	90

*Percentages may not total 100% because of those responding "Does Not Apply."

SUNBATHING/SWIMMING

Orientation

The sunbathing/swimming areas at Hood Park and McNary Beach are heavily used but well balanced. Float lines and diving platforms are provided. Sunbathers use the grass areas. Portions of beach area at Hood Park are eroded as a result of large traffic, water fluctuation, and waves from boaters. At McNary Beach, the new parking areas, the establishment of an attractive lawn area, and the shore improvements appear to be very successful.

The findings presented in the remainder of this section are based on the User Survey. This survey obtained 59 responses from sunbathers and swimmers at McNary (38 at Hood Park and 21 at McNary Beach).

User characteristics

Table 34 indicates the characteristics of the sunbathers and swimmers surveyed at McNary.

Table 34

Sunbather/Swimmer Characteristics

Age	Percent of Sunbathers/Swimmers	Group Size	Percent of Sunbathers/Swimmers
<18	14	1	17
18 - 25	32	2	22
26 - 40	46	3 - 4	25
41 - 55	8	5 - 8	29
56 - 65	0	9 - 12	3
>65	0	>12	3

Travel Time to Project Area	Percent of Sunbathers/Swimmers	Visit Duration	Percent of Sunbathers/Swimmers
<15 minutes	44	1 - 4 hours	41
15 - 30 minutes	39	5 - 8 hours	51
30 - 60 minutes	10	1 day	5
1 - 2 hours	7	2 days	0
2 - 3 hours	0	3 days	3
3 - 5 hours	0	4 days	0
>5 hours	0	5 - 7 days	0
		>7 days	0

No. of Other Activities	Percent of Sunbathers/Swimmers
0	3
1	54
2	29
3	10
4	3
5	0
6	0
>6	0

User opinions

Spacing preferences - Tables 35 and 36 indicate the spacing that sunbathers and swimmers surveyed at McNary and elsewhere prefer.

Table 35

Preferred Distance Responses*

Sample	Sample Size	Range	Mean	Median	Mode
All Sunbathers surveyed	161	3- a	30	20	15, 20
McNary	17	15- a	35	28	-
Hood Park	10	15- a	38	40	40
McNary Beach	7	15-60	31	20	15, 20
All Swimmers surveyed	120	2-200	25	20	20
McNary	25	5-200	34	35	40
Hood Park	16	5- 50	34	35	40
McNary Beach	9	20-200	33	35	30, 40

*In feet; See Appendix A for definitions of terms.
a - response of "alone" or "out of sight."

Table 36

Preferred Distance Responses in Planning Range and Preference Groupings*

Sample	% in Planning Range[1](5'-50')	% in A[2] (5'-14')	% in B[2] (15'-20')	% in C[2] (21'-30')	% in D[2] (31'-50')
All Sunbathers surveyed	88%	27%	39%	20%	14%
McNary	82	0	43	14	43
Hood Park	80	0	25	0	75
McNary Beach	86	0	67	33	0
Sample	**% in Planning Range[1](5'-50')**	**% in A[2] (5'-14')**	**% in B[2] (15'-24')**	**% in C[2] (25'-34')**	**% in D[2] (35'-50')**
All Swimmers surveyed	90%	25%	41%	19%	15%
McNary	92	4	17	26	52
Hood Park	100	6	13	31	50
McNary Beach	78	0	29	14	57

*See Appendix A for definitions of terms; See Technical Report for a full development of spacing preference information.
[1]Percentage of all preferred distance responses.
[2]Percentage of all preferred distance responses in Planning Range.

Greater spacing is preferred more frequently by sunbathers and swimmers at McNary than by those in the total survey.

Reasons for pleasant/unpleasant experience - Tables 37 and 38 indicate the impact that different factors had on making the sunbathing or swimming experience pleasant or unpleasant for users at the two areas surveyed. "Car parking facilities," "enforcement of rules and regulations," and "steepness of the slopes" were the factors which most often made the experience at McNary Beach unpleasant. One user indicated that he would not return (see Table 39).

Tables 40 and 41 indicate the changes in the physical condition and people's use of the areas reported by sunbathers and swimmers from their previous visit.

Table 37

Reasons Making Recreation Experience Pleasant or Unpleasant--Sunbathing/Swimming
Hood Park

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons Characteristics and behavior of other people	89	-	8
Distance from other people	94	8	
Number of people in other visitor groups	54	16	30
Number and type of other activities occurring here	84	-	16
Scenic views	81	14	5
Noise	81	11	8
Accidents or near accidents	78	-	3
Enforcement of rules/regulations	97		3
Car parking facilities	81	19	-
Theft	86	-	-
Vandalism	86	-	-
Land-Based Reasons Amount of facilities (restrooms, water, etc.)	89	11	-
Convenience to facilities (restrooms, water, etc.)	88	14	-
Maintenance of facilities	100	-	-
Condition of trees and landscape	100	-	-
Condition of grass or soil	100	-	-
Water-Based Reasons Water quality	84	14	3
Formal designation of places for your activity	81	-	-
People in areas they shouldn't be	95	-	-

*Percentages may not total 100% because of those responding "Does Not Apply."

Table 38

Reasons Making Recreation Experience Pleasant or Unpleasant--Sunbathing/Swimming
McNary Beach

Reasons	Percentage* of Users Responding:		
	Pleasant	Unpleasant	Not Important
General Reasons			
Characteristics and behavior of other people	100	-	-
Distance from other people	100	-	-
Number of people in other visitor groups	60	-	40
Number and type of other activities occurring here	70	-	30
Scenic views	100	-	-
Noise	80	20	-
Accidents or near accidents	80	20	-
Enforcement of rules/regulations	70	30	-
Car parking facilities	90	-	10
Theft	100	-	-
Vandalism	100	-	-
Land-Based Reasons			
Amount of facilities (restrooms, water, etc.)	85	15	-
Convenience to facilities (restrooms, water, etc.)	100	-	-
Maintenance of facilities	100	-	-
Condition of trees and landscape	100	-	-
Condition of grass or soil	100	-	-
Water-Based Reasons			
Water quality	90	10	-
Formal designation of places for your activity	37	-	-
People in areas they shouldn't be	90	10	-

*Percentages may not total 100% because of those responding "Does Not Apply."

Table 39

Number and Percent of Users That Indicated They Would Not Return to the Activity Area and Their Reasons

Area	Number and percent of users surveyed who indicated they would not return #	%	Reasons for not wanting to return
McNary Beach	1	5%	"Enforcement of rules and regulations" (drugs)

Table 40

Positive and Negative Changes Noticed in the Physical Conditions of the Area - Items Mentioned by Sunbathers and Swimmers

Area	Positive Changes		Negative Changes	
Hood Park	"Cleaned up"	(5)	"Don't like seaweed"	(2)
	"Trees, landscaping"	(3)	"Beer bottles broken on bottom"	(4)
	"Nice swimming area"	(1)	"Bugs"	(1)
	"Less broken glass in the water"	(1)		
	"Ropes in closer"	(2)		
	"Better facilities"	(1)		
	"Better camping"	(1)		
	"Cleaner restrooms"	(1)		
McNary Beach	"More sand"	(4)	"Beach too narrow, not enough sand"	(2)
	"More parking"	(3)	"Should have a concession stand"	(1)
	"Restrooms clean"	(2)		
	"Better maintenance"	(1)		
	"Like the grass and trees"	(4)		

NOTE: The number in parenthesis (#) indicates the number of times the change was mentioned.

Table 41

Positive and Negative Changes Noticed in the People's Use of the Area - Items Mentioned by Sunbathers and Swimmers

Area	Positive Changes	Negative Changes
Hood Park	"Result of cleaner area" (1)	"More people" (2)
	"Nice people" (1)	
McNary Beach	"Cleaned after dogs" (1)	"Drugs, pot" (2)
		"Horses" (2)
		"Kids who vandalize restrooms" (1)

NOTE: The number in parenthesis (#) indicates the number of times the change was mentioned.

Acceptability of techniques - Table 42 indicates the acceptability of different techniques for solving problems to the sunbathers and swimmers surveyed at McNary.

The acceptability of most techniques is very clear: at least 60 percent of the respondents agreed on one of the 3 levels of acceptability for 11 of the 18 techniques. But even for those techniques which most respondents found to be acceptable, up to 44 percent found them to be unacceptable. Thus, project management should expect some opposition to any technique used.

Table 42

User Acceptability of Techniques--Sunbathing/Swimming
McNary Dam

Techniques	Levels of Acceptability Percentage* of Users Responding:		
	Very Acceptable	Mildly Acceptable	Unacceptable
General Planning Techniques			
Keep major recreation areas more separated	70	21	9
Make vehicle access to areas less convenient	11	28	61
Make area's existence less obvious	5	9	79
Site Planning Techniques			
Redesign area to accommodate fewer users	25	16	56
Design for greater distance between people	30	25	26
Reduce number of parking spaces	28	16	56
Management Techniques			
Procedures:			
Require permits		12	88
Charge/increase fees	16	16	67
Rules and Regulations:			
Impose more rules	7	9	77
Provide stricter enforcement of rules	20	32	40
Close areas when natural resource destruction reaches critical point	79	16	5
Close areas when they become "too full"	37	20	44
Reduce number of activities in same area	54	14	32
Limit number of people in visitor groups	5	18	74
Keep unnecessary vehicles out	56	14	23
Services:			
Provide more and better information	88	7	5
Increase maintenance and restoration	66	20	14
Reduce facilities and services	-	11	89

*Percentages may not total 100% because of those responding "Does Not Apply."

PART 3: ANALYSIS OF SELECTED PROBLEMS/SITUATIONS

PART 3: ANALYSIS OF SELECTED PROBLEMS/SITUATIONS

This final section identifies and examines selected problems and situations at McNary. The section is not intended to provide solutions to all project area problems. Nor is it a substitute for project area master planning. The solutions/techniques are intended to be only suggestions for further consideration by project area personnel, for they are most familiar with the intricacies associated with these problems.

In many cases, the project area staff is already aware of these problems or situations and is in the process of dealing with them. And in some cases, the solutions/techniques listed in Table 43 may not be practical or possible because of management, budget, or other constraints.

Table 43

Analysis of Selected Problems/Situations

Area/Subject	Problem/Situation	Possible Solutions/Techniques
Madame Dorian Camping area	Potential for overuse--because of the dry climate and lack of hardened pads and circulation controls.	o provide hardened (gravel or paved) camp pads or "impact sites." o eliminate opportunities for random traffic movement. o provide better campsite delineation. o consider the feasibility of providing irrigation to the area.
Hood Park Boat Ramp	Overcrowding and congestion at boat ramp.	o designate parking spaces more formally. o utilize circulation controls to reduce congestion and expedite flow to and from the ramp. o provide a longer and wider ramp in deeper water. o consider establishing a no-wake area in the vicinity of the ramp.

Area/Subject	Problem/Situation	Possible Solutions/Technqiues
		o provide a courtesy (handling) dock. o on holiday weekends, provide ranger to help direct traffic and circulation. o Figure 1 illustrates a hypothetical launching ramp to demonstrate ways in which the carrying capacity at a ramp might be increased.
McNary Beach	Some problems noticed between swimmers and boaters on water surface.	o prohibit boats in and around swimming area. o establish no wake zone around the swimming area.
Hood Park Picnic Area	Appears to be a shortage of parking and a shortage of grills.	o provide additional parking and monitor use. o provide additional grills.
	Complaints about dogs not on their leashes.	o provide strict enforcement of regulations (this will be good public relations because it will be favored by many users and disfavored by relatively few users).
Swimming beach areas	Shoreline erosion caused by water fluctuation and waves.	o provide shoreline stabilization where appropriate. o replenish sand periodically.
Water surface	Occasionally there are some conflicts between water surface users (at Hood Park, McNary Beach, and other developed recreation areas).	o provide more information to users regarding their role in helping to assume an enjoyable recreation experience.
Off-road Vehicle (ORV) Riding	There are no designated ORV areas at McNary; there have been some problems with ORV's disturbing resources.	o continue to protect resources by using fences and other barriers. o consider the possibility of providing a designated area(s) for ORV riding.
Hiking	The Wildlife Park Trail may be underused (few users were observed during the User Survey).	o make more people aware of these trails. o provide more directional signs to the trails. o consider providing additional trails which link activity areas together.

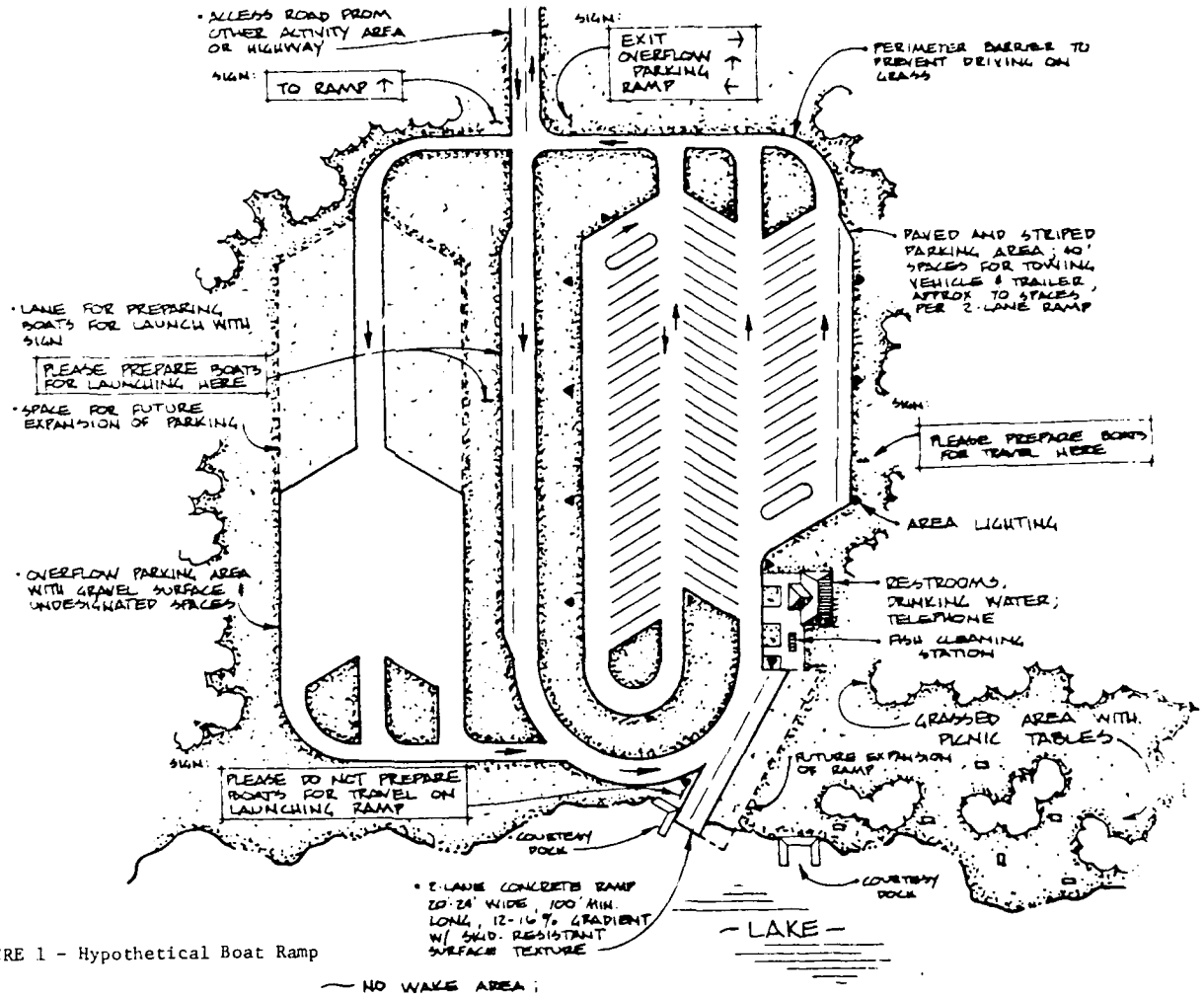


FIGURE 1 - Hypothetical Boat Ramp

APPENDICES

APPENDIX A: KEY TERMS

1. Activity area - The specific area where an individual primary activity occurs (e.g., a campground, the lake, a hiking trail, a picnic area, etc.).

2. Capacity, recreational carrying - The capability of a recreational resource to provide opportunity for certain types of satisfactory recreation experiences over time without significant degradation of the resource. Inherent in this view of carrying capacity are resource (biophysical) and social (psycho-social) capacities.

3. Capacity, resource - The level of recreational use of a resource beyond which irreversible biological deterioration takes place or degradation of the physical environment makes the resource no longer suitable or attractive for that recreational use.

4. Capacity, social - The level of recreational use of a resource or area beyond which the user's expectation of the experience is not realized and he/she does not achieve a reasonable level of satisfaction.

5. Carrying capacity guidelines - The levels of use and the methods used to obtain and achieve them which are recommended in this report.

6. Factors - The characteristics and phenomena which influence carrying capacity.

7. Indicators - The phenomena which can be used to identify or measure the degree of overcrowding or overuse, and which can be used in conjunction with a monitoring system to help predict when problems of overuse and overcrowding will occur if preventive measures are not taken.

8. Management/site survey - The initial survey conducted at the study project areas where resource managers, rangers, and maintenance personnel were interviewed and a reconnaissance was made of "overused," "overcrowded," "underused," and "well-balanced" recreation areas. (See Appendix B)

9. Mean - The measure of central value defined as the sum of all observations divided by the number of observations.

10. Median - The measure of central value defined as the point on the scale of observations which is the middle observation (if there is an odd number of cases) or which is the mean of the two central observations (if there is an even number of cases).

11. Mode - The measure of central value defined as the observation with the largest frequency.

12. Monitoring - The periodic assessment of the impact that use levels have on the social capacity or resource capacity of an area.

13. Overcrowding - A condition where the user does not achieve a satisfactory recreational experience because of too many people, inadequate distances between sites, etc.

14. Overuse - A condition where (during the course of a season/year) degradation of the physical environment makes the resource no longer suitable or attractive for recreational use.

15. Planning range - The range of spacing distances for an activity which satisfies the spacing preferences of the majority of recreators participating in that activity, which at the same time accounts for other considerations (e.g., cost, safety, equity, etc.).

16. Preference distribution - The set of preference groupings for an activity which can be modified to develop the social carrying capacity of an area.

17. Preference groupings - The range of spacing distances for an activity which satisfies the similar spacing preferences of a group of recreators participating in that activity.

18. Primary activity - The major recreation activity which brought the visitor to the recreation area.

19. Project area - The land and water area of the total Corps of Engineers Project.

20. Project management - The project area staff, district personnel, and other people involved with project area management.

21. Recreation area - Corps-managed areas specifically identified for recreational use within the total Project Boundary; usually named.

22. Recreation day - A standard unit of use consisting of a visit by one individual to a recreation development or area for recreation purposes during any reasonable portion or all of a 24-hour period.

23. Recreation environment - An activity area together with its various recreation settings.

24. Recreation resource - The land and/or water areas, with associated facilities, which provide a base for outdoor recreation activities.

25. Recreation setting - The physical, development/control, activity/use relationship components of an activity area; taken as a whole, the various settings comprise a particular "recreation environment" for each activity area.

26. Recreation unit - A campsite, picnic table, boat, off-road vehicle, user group, or other unit which when spaced together with other units represents a use level or density.

27. Representative recreation setting - The most typical recreation setting for a particular activity.

28. Secondary activities - Incidental activities; activities which are supplemental to the primary activity.

29. Study activity area - An activity area at which the management/site survey and the user survey was conducted.

30. Study project area - One of the 11 project areas at which the management/site survey and the user survey were conducted. These project areas are: Barkley Lock and Dam, Benbrook Lake, Hartwell Lake, McNary Lock and Dam, Milford Lake, New Hogan Lake, Lake Ouachita, Lake Shelbyville, Shenango River Lake, Somerville Lake, and Surry Mountain Lake.

31. Title 36 - Part 327, Chapter III, of Title 36 of the Code of Federal Regulations which provides rules and regulations governing the public use of water resource development projects administered by the Army Corps of Engineers.

32. Underuse - A condition where use levels are significantly less than their potential service level.

33. User survey - The survey that provided user preference information used in developing social capacity guidelines; information was obtained from users at the study project areas by means of a questionnaire (see Appendix B).

34. Well-balanced use - A condition which exhibits just the right amount of use to satisfy users and protect the resource.

APPENDIX B: EXAMPLE SURVEY FORMS

This Appendix includes on the following pages examples of the survey forms that were used during the Management/Site Survey and the User Survey.

MANAGEMENT/SITE SURVEY

PICNICKING QUESTIONNAIRE

(Resource Manager, Head Ranger, Maintenance Foreman)

Project Area Name _____

Respondent Name _____ Title _____

Interviewer _____ Date _____

1. PICNICKING USE AREA INFORMATION (selected areas)

Recreation Area/Use Area Names	Support Facilities	Fee Charged	Acres: Total Use Area	Acres: Activity Area Only	Total Picnic Sites	List Primary Activities Adjacent to Area	When Started
OVERCROWDED							
OVERUSED							
UNDERUSED							
WELL-BALANCED							

Picnicking

2. VISITOR CHARACTERISTICS RELATED TO OVERCROWDING/OVERUSE

Recreation Area/Use Area Names (same as in #1)	# of picnicking groups on typical recreation season weekend day	Typical Length of Stay	Typical Ages	Typical Group Size	Origin of visitors[1] % U	% S	% R	Approximate # of miles most visitors travel to use area: High	Average	Average Frequency of visits per year
OVERCROWDED										
OVERUSED										
UNDERUSED										
WELL-BALANCED										

NOTES: [1]U = Urban location (city), S = Suburban location, R = Rural

Picnicking

3. CAUSES & EFFECTS OF OVERCROWDING/OVERUSE

Use Area Names (same as in #1 & #2)	Actual Complaints (list in order of frequency)	Causes		Effects	
		Observed	Surmised	Observed	Surmised
OVERCROWDED					
OVERUSED					
UNDERUSED					
WELL-BALANCED					

Picnicking

4. OCCURRENCE OF OVERUSE/DEGRADATION

Use areas which experience overuse (from #1)	Off-season restoration potential: Recovers naturally	Off-season restoration potential: Requires treatment	Off-season restoration potential: Beyond off-season restoration	Approximate Dates of Recreation season (____ to ____)	When signs of degradation first occur: Approx. date	When signs of degradation first occur: Approx. visitor groups to date	When highest degradation is reached: Approx. date	When highest degradation is reached: Approx. visitor groups to date

5. INDICATORS (SIGNS) OF OVERCROWDING

Indicators	Assign relative importance using a numerical rating on a scale of 1 (least) to 10 (most)	Comments
o Increase in the # of complaints		
o Arguments/conflicts between picnickers		
o Shorter stays		
o Fewer returnees		
o Increase in crime		
o Increase in noise		
o Picnicking, in non-picnic areas		
o Crowded support facilities		
o Increase in litter		
o Increase in resource and facility destruction		
o Occurrence of displacement/succession (changes in visitor characteristics)		
o Increase in number of accidents involving vehicles		
o Increase in use levels		

(Please list others below)

o

o

o

Picnicking

6. INDICATORS OF OVERUSE/DEGRADATION

Indicators	Assign relative importance using a numerical rating on a scale of 1(least) to 10 (most)	Comments
o Ground cover wearing away		
o Damaged trees and/or undergrowth		
o Absence/change in wildlife		
o Increased erosion/sedimentation		
o Little deadfall		
o Compacted soils		
o Increased litter/trash		
o Trees cut down		
o Increased runoff		
o Need for replacement of support facilities before normal life period		
o Rodent infestation		

(Please list others below)

o

o

o

o

7. FACTORS AFFECTING RESOURCE CARRYING CAPACITY

Picnicking

Factors	Assign relative importance using a numerical rating on a scale of 1 (least) to 10 (most)	Comments
o Resiliency of vegetation type		
o Resiliency of soils		
o Resiliency of wildlife		
o Degree of normal maintenance applied		
o Degree of off-season restoration applied		
o Site drainage		
o Slope/topography		
o Climate/micro-climate		
o Group size		
o Slope orientation		
o Tree cover		
o Level of development (e.g. paved roads/paths vs. unpaved roads/paths)		

(Please list others below)

o

o

o

8. FACTORS AFFECTING SOCIAL CARRYING CAPACITY

Factors	Assign relative importance using a numerical rating on a scale of 1 (least) to 10 (most)	Comments
o Similarity of visitor groups		
o Slope orientation		
o Distance from highway access		
o Proximity to the water		
o Scenic views or vistas		
o Quality/variety of natural amenities		
o Number, type, and degree of man-made intrusions or disturbances (power lines, buildings, etc.)		
o Visual screening between picnickers		
o Density/type of vegetation		
o Distance between picnic sites		
o Degree of designation		
o Level of support facilities		
o Proximity to support facilities		
o Size of picnicking area		
o Charging of fees		
o Compatibility of nearby primary activities		
o Single purpose or multi-purpose recreation area		
o Distance traveled		
o Frequency of visits		
o Origin of user (urban, suburban, rural)		
o Configuration of area		
o Degree of maintenance		
(Please list other factors)		
o		
o		

9. PRESENT/PAST CAPACITY MANAGEMENT

Planning

Use areas where capacity management techniques were, or are now, applied (Name)	Past (√)	Present (√)	List capacity management techniques(s) used	Describe level of effectiveness (pros/cons regarding visitor satisfaction and resource protection)	Assessment of management feasibility (pros/cons why the technique could or could not be implemented)

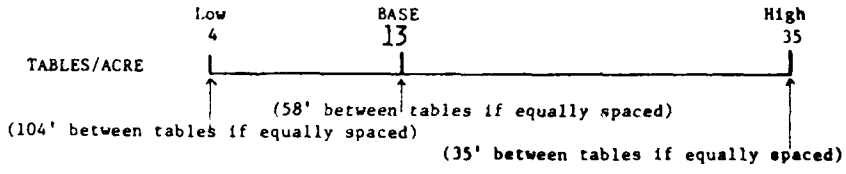
Picnicking

10). POSSIBLE CARRYING CAPACITIES

Use Area Names	Present capacity actual or estimated	Best guess as to what the capacity should be	Principal factors
THE MOST OVERCROWDED AREA:			
THE MOST OVERUSED AREA:			
THE MOST UNDERUSED AREA:			
THE MOST WELL-BALANCED AREA:			

EXAMPLES FROM BUREAU OF OUTDOOR RECREATION CAPACITY RESEARCH:

(Use as a general guide when estimating what the capacity should be)



MANAGEMENT/SITE SURVEY

CAMPING

USE AREA ANALYSIS SHEET

(for URDC staff use)

Project Area Name _____ Field Analyst(s) _____

Recreation Area and/or Use Area _____

_____ Weather _____

Code # _____ Date _____

			ANSWER COLUMN	COMMENT CODE	COMMENTS:
SITE AWARENESS	Signage (camping or name)	Between main highway and use area entrance			
		At use area entrance			
	Exposure of Site	Between main highway and use area entrance			
		At use area entrance			
	Relationship to Main Highway	Distance to area from main highway			
SITE ACCESS	Road Conditions	Road to site from main highway			
		Paved(P) or Unpaved(U)			
		Condition (E, G, P)			
		Estimated Width			
		Road within use area			
		Paved(P) or Unpaved(U)			
		Condition (E, G, P)			
		Estimated Width			
		Presence of informal roads			
SLOPES & VEGETATION	Slopes	% of area 0 - 5%			
		% of area 6 - 9%			
		% of area 10%+			
		Existence of unique land form			
	Vegetation	Density of trees			
		% dense			
		% moderate			
		% sparse			
		% little or none			
		Density of understory			
		% dense			
		% moderate			
		% sparse			
		% little or none			
	On the Use Area	Geologic, cultural, archeologic features			
		Abundance of wildlife			
		Water feature			

NATURAL AMENITIES	From the Use Area	V... ...y to wate... ... ... (Insert) O - outstanding G - good U - undesirable	Se... ... obstructed / Moderately obstructed / Mildly obstructed / Unobstructed	
		Visibility to other natural areas (Insert) O - outstanding G - good U - undesirable	Severely obstructed / Moderately obstructed / Mildly obstructed / Unobstructed	
CONDITION OF NATURAL FEATURES	Vegetation & Soils	Distance to lake		
		Dead or trampled vegetation		
		Evidence of taking		
		Compacted soils		
	Drainage	Wet soils/standing water		
		Erosion		
FACILITIES & SERVICES	Facility/ Service Distribution (S - Site D-Distributed C - Centralized)	Electric hook-ups		
		Water hook-up		
		Improved pad		
		Picnic tables		
		Cooking grill		
		Firewood		
		Drinking water (cold)		
		Hot water		
		Showers		
		Flush toilets		
		Vault toilets		
		Pit toilets		
		Dumping station		
		Shelter		
		First aid station		
		Telephone		
		Lighting (R - Road, P - Parking W - Walkway, C - Comfort area		
		Recreation area or equipment		
		Convenience store		
	Condition	Excellent		
		Good		
		Need attention		
PLANNING DESIGN ASPECTS	Distance between campsites	Minimum		
		Maximum		
		Average		
	Distance between campsites and the facilities	Minimum		
		Maximum		
		Average		
	Space for camper unit maneuverability	Ample		
		Acceptable		
		Restrictive		
	Access ... control	Controlled (gate, attendant)		
		Uncontrolled		

Car Parking	[illegible] on e[illegible] camp- site	
	Road parking	
Buffer between campsites	Man-made	
	Natural vegetation	
	Planted landscape	
	None	

RELATIONSHIP OF CAMPING USE AREA TO OTHER USE AREAS

Use area name	Activity	Estimated direct distance from camping use area	Pedestrian accessibility to other use area: Easy	Mod-erate	Diffi-cult	Visibility to other use area: Ob-structed	Semi-ob-structed	Unob-structed	Reasons for accessibility and/or visibility situation

ANALYST'S PERCEPTION OF ACTIVITY AREA'S CARRYING CAPACITY

List the resource/physical factors you feel most affect carrying capacity on this site

_____

_____

_____

_____

_____

Should resource/physical carrying capacity of this site be: _____ higher _____ lower _____ same

List possible techniques which might be used to increase and/or to limit capacity on this site.

_____

_____

_____

CORPS OF ENGINEERS USER CAPACITY SURVEY

Notations ☐

Date ____ Day ____ OMB Clearance # 49-R0419

Time (Hour) ____ Expires October 1983

Weather ____ Project Area Name ____

Interviewer ____ Recreation Area Name ____

Activity ____ Code ____ Activity Area ____ Code ____

We are conducting a survey for the Army Corps of Engineers at selected Corps recreation areas throughout the country. Through these surveys, we will discover how visitors feel about overcrowding and overuse of these recreation areas. The Corps will use this information to help make decisions about the use and protection of its recreation areas. Would you be willing to take fifteen minutes of your time to answer some questions about your visit here?

BASIC VISITOR CHARACTERISTICS

1. In which category is your age?

17 & under	☐
18 - 25	☐
26 - 40	☐
41 - 55	☐
56 - 65	☐
66 & over	☐

2. How large is your group?

1	☐
2	☐
3- 4	☐
5- 8	☐
9-12	☐
13+	☐

3. Is this your main destination or a stopover on a trip?

Main destination ☐

Stopover on trip ☐

4. How long did it take you to travel here from your home __ (✓) or last destination __ (✓)?

Under 15 minutes	☐
15-30 minutes	☐
30 min. - 1 hour	☐
1 - 2 hours	☐
2 - 3 hours	☐
3 - 5 hours	☐
5+ hours	☐

VISITOR PARTICIPATION

5. How many times did you participate in this activity anywhere last year? (If "0", go to question 7)

0	☐
1 - 5	☐
6 - 10	☐
11 - 20	☐
21 - 30	☐
31+	☐

6. How many times have you participated in this activity at this lake? ____

a) Last year?		b) So far this year?	
0	☐	0	☐
1- 2	☐	1- 2	☐
3- 4	☐	3- 4	☐
5- 7	☐	5- 7	☐
8-10	☐	8-10	☐
11-19	☐	11-19	☐
20+	☐	20+	☐

7. How long are you staying on this visit?

1 - 4 hours	☐
5 - 8 hours	☐
1 day(overnight)	☐
2 days	☐
3 days	☐
4 days	☐
5 - 7 days	☐
8 or more days	☐

8. Have you participated in this activity at this specific location anytime before this visit?

No ☐ (go to #9) Yes ☐ Please list any changes you have noticed in the physical condition of this location or in people's use of the area.

Physical conditions:

☐ Positive ____

☐ Negative ____

People's use of the area:

☐ Positive ____

☐ Negative ____

9. Would you say the number of people who are now participating in this activity are:

too many ☐ too few ☐ just the right number ☐

WES Form ____ R ____
Expiration ____

[illegible]

[illegible]

[illegible] activities? [illegible]

[illegible] are too close, how far away would you like them to be? [] Not Applicable

[illegible] [] twice as far [] three times [] more than [] further [illegible]

[illegible] [illegible] distance would you like?

[illegible] like them to be

[illegible] following reasons are make your present activity at this location [illegible] unpleasant?

	Unpleasant	Unpleasant	Not Important	Does Not Apply
[illegible]				
[illegible] and crowded at other [illegible]	[]	[]	[]	[]
[illegible] people	[]	[]	[]	[]
[illegible] people to other visitor [illegible]	[]	[]	[]	[]
[illegible] other activities [illegible]	[]	[]	[]	[]
[illegible]	[]	[]	[]	[]
[illegible] views	[]	[]	[]	[]
[illegible]	[]	[]	[]	[]
[illegible] of [illegible] accidents	[]	[]	[]	[]
[illegible] [illegible] rules/regulations	[]	[]	[]	[]
[illegible] [illegible] facilities	[]	[]	[]	[]
[illegible]	[]	[]	[]	[]
[illegible]	[]	[]	[]	[]
[illegible]	[]	[]	[]	[]

[illegible]

[illegible]	[]	[]	[]	[]
[illegible] natural landscape	[]	[]	[]	[]
[illegible] [illegible] other people	[]	[]	[]	[]
[illegible] of facilities (restrooms, water, etc.)	[]	[]	[]	[]
[illegible] to facilities (restrooms, water, etc.)	[]	[]	[]	[]
[illegible] to the water body	[]	[]	[]	[]
[illegible] of [illegible]	[]	[]	[]	[]
[illegible] of facilities	[]	[]	[]	[]
[illegible] of trees and landscape	[]	[]	[]	[]
[illegible] of trees or soil	[]	[]	[]	[]
[illegible]	[]	[]	[]	[]
[illegible]	[]	[]	[]	[]

[illegible] [illegible]

[illegible]	[]	[]	[]	[]
[illegible]	[]	[]	[]	[]
[illegible] [illegible] place for your activity	[]	[]	[]	[]
[illegible] to launch boat	[]	[]	[]	[]
[illegible] to retrieve boat	[]	[]	[]	[]
[illegible] [illegible] shouldn't be	[]	[]	[]	[]
[illegible]	[]	[]	[]	[]
[illegible]	[]	[]	[]	[]

[illegible] above reasons, [illegible] you from [illegible] a [illegible]

[illegible] []

[illegible] [illegible] [illegible] checked "Unpleasant" above?

12. If recreation areas have too many people for each to enjoy the activity or if areas become damaged by too much use, there are some solutions for reducing that overcrowding or overuse. Please indicate which of the following possible solutions you would find very acceptable, mildly acceptable, or unacceptable for reducing crowding and/or natural resource destruction in this location. (If this location is not overcrowded or overused, assume that it is for this question.)

POSSIBLE SOLUTIONS FOR OVERCROWDING OR OVERUSE	Very Acceptable	Mildly Acceptable	Unacceptable	Does Not Apply
PUBLIC AWARENESS/EASE OF ACCESS SOLUTIONS				
1. Make vehicle access to areas less convenient.	☐	☐	☐	☐
2. Make the area's existence less obvious to the general public (fewer signs and directions)	☐	☐	☐	☐
3. Provide more and better information on how to use the area	☐	☐	☐	☐
ACTIVITY RELATIONSHIPS & USE DENSITY				
4. Keep major recreation activities more separated from one another.	☐	☐	☐	☐
5. Reduce the number of different activities occurring in the same area	☐	☐	☐	☐
6. Design for greater distance between people	☐	☐	☐	☐
7. Limit the number of people in each group	☐	☐	☐	☐
8. Change natural surfaces by hardening them to withstand more use.	☐	☐	☐	☐
9. Increase maintenance and restoration to allow more use	☐	☐	☐	☐
PLANNING & DESIGN SOLUTIONS				
10. Reduce the type and number of facilities and services provided	☐	☐	☐	☐
11. Keep unnecessary vehicles out of areas	☐	☐	☐	☐
12. Reduce number of parking spaces to limit number of users	☐	☐	☐	☐
13. Provide landscaped buffers between visitor groups to increase privacy	☐	☐	☐	☐
14. Redesign area to accommodate fewer users	☐	☐	☐	☐
RULES & REGULATIONS SOLUTIONS				
15. Have stricter enforcement of regulations	☐	☐	☐	☐
16. Impose more rules and regulations.	☐	☐	☐	☐
17. Require prior reservations to use areas.	☐	☐	☐	☐
18. Require permits to use areas	☐	☐	☐	☐
19. Close down areas when natural resource destruction reaches critical point	☐	☐	☐	☐
20. Charge fees or increase fees now charged	☐	☐	☐	☐
21. Close gates when areas get "too full".	☐	☐	☐	☐
OTHERS				
_____	☐	☐	☐	☐
_____	☐	☐	☐	☐
_____	☐	☐	☐	☐
_____	☐	☐	☐	☐

Please answer the following questions about your other recreation activities on this visit.

	a) What are your other recreation activities on this visit?	b) Are they within walking distance from this location (use launching location for boat activities)? (1) Walking distance	(2) Driving distance	c) What is your main recreation activity on this visit?
[illegible]	☐	☐	☐	☐
Boating	☐	☐	☐	☐
Waterskiing	☐	☐	☐	☐
Swimming	☐	☐	☐	☐
Sightseeing	☐	☐	☐	☐
Picnicking	☐	☐	☐	☐
Warm water fishing	☐	☐	☐	☐
Boat fishing	☐	☐	☐	☐
Hiking	☐	☐	☐	☐
Motorcycle riding	☐	☐	☐	☐
Off-road vehicle riding	☐	☐	☐	☐
[illegible]	☐	☐	☐	☐
[illegible]	☐	☐	☐	☐
[illegible]	☐	☐	☐	☐
[illegible]	☐	☐	☐	☐
None	☐	☐	☐	☐

CAMPING ACTIVITY (Check)

Tent	☐
Tent trailer	☐
Truck-mounted camper	☐
Travel trailer	☐
Van	☐
Motor home	☐
	☐
	☐

Boat Activities

Day sailer	☐
Sailer (cabin)	☐
Canoe	☐
Row boat	☐
Power boat (less than 25 hp)	☐
Power boat (25+ hp)	☐
Houseboat or cruiser	☐
	☐
	☐

Off-Road Vehicle Riding

Trail bike	☐
Motorcycle	☐
ATV	☐
Dune buggy	☐
4-wheel drive	☐
	☐
	☐

REPLACEMENT QUESTIONS TO ASK DURING BOAT LAUNCHING INTERVIEWS

(Write answers and comments directly on the Boat Survey Interview Sheet)

10. a) Would you say that the time it takes you to launch your boat at this ramp is:

too long ☐ long, but tolerable ☐ just right ☐

(Approximately how long does it take to launch your boat at this ramp? Actual or estimated time to be recorded by interviewer _____)

b) How long would you prefer it to take:

just a little faster ☐ twice as fast ☐ three times faster ☐ more than three times faster ☐

c) What could be done to expedite boat launching at this ramp:

_____

_____

_____

APPENDIX C: PROJECT AREA DESCRIPTION

McNary

Location

McNary Lock and Dam and Lake Wallula (Walla Walla District) are located on the Columbia River, 292 miles from the Pacific Ocean. The Washington cities of Richland, Kennewick, and Pasco border the lake. The dam is located 30 miles northwest of Pendleton, Oregon, and 45 miles southwest of Walla Walla, Washington.

Authorization and purpose

The McNary Lock and Dam Project was authorized under the River and Harbor Act of 1945 for the purposes of navigation improvement, hydroelectric power generation, and irrigation.

Project area size and features

The watershed area above Lake Wallula covers 214,000 square miles. Total land area within project area boundaries amounts to 12,290 acres. At the normal recreation pool elevation, Lake Wallula covers 35,922 acres, is 120 feet deep at its greatest depth near the dam, and has 242 miles of shoreline.

Major structural facilities at the project include the navigation lock and powerhouse, the spillway dam, a pair of fish ladders, and earth and rockfill shore abutments.

Two offices share management responsibility for the project area. Corps employees include hydroelectric operations personnel, and clerical and maintenance personnel. Many maintenance services are carried out on a contract basis.

Topography

More than two-thirds of the land bounding Lake Wallula is characterized by steep basalt formations. The Columbia canyon above the McNary Dam site is generally from two to five miles in width, and its walls rise from a few hundred feet to as much as 1200 feet above the river bed. With the exceptions of the upper Snake and lower Yakima Rivers, the valleys of the tributary streams are generally narrow.

[illegible]

The climate of the area is arid. Maximum summer temperatures [illegible] about 90 degrees F. (with extremes to over 110 degrees F.). Winter minimum temperatures average near 30 degrees F., although on rare occasions the temperature may drop below 0 degrees F. Precipitation averages [illegible] annually, with much occurring as light, intermittent rains in winter and spring. Snowfall is infrequent and usually light. Prevailing winds are from the southwest at usually less than 10 mph. Blowing dust is not uncommon, though sustained wind velocities rarely exceed 30 mph. Severe dust storms have arisen in the area, occurring most frequently in spring, with wind speeds up to 100 mph.

Soils and vegetation

Three types of soils characterize the area: the uplands soils [illegible] formed from loess and are mostly deep, well-drained, and medium [illegible] soils [illegible] on arroyos and steep [illegible] are formed from a mixture of loess and fragments of basalt that overlay basalt bedrock; bottomland [illegible] are composed of alluvial material that has been washed from the uplands or [illegible] of the area. Soils in the area are moderately to highly susceptible to both wind and water erosion. Trees are scarce and vegetation [illegible] grasses, cactuses, forbs, and low shrubs.

Fish and wildlife

Fish species in the lake include chinook, coho salmon, shad, [illegible], catfish, and brown trout, crappie, smallmouth, and largemouth [illegible], bullhead catfish, and white sturgeon.

Predatory animals on project lands include coyotes, mink, [illegible], and bobcats. Mule deer, the kangaroo rat, black-tailed jackrabbit, badger, raccoon, skunk, and rock chuck are relatively common, and [illegible] and beaver are two native aquatic species. Reptiles include [illegible] horned lizard, the gopher, garter, and ring-necked snakes, and [illegible] rattlesnake. Many species of song birds live by the lake, along with [illegible] geese, mallard ducks, and whistling swan. Upland game birds include ring-necked pheasants, California quail, and chukar partridges.

Population areas
served and accessibility

The project's recreational facilities serve visitors from an extremely large area in northeastern Oregon and southeastern Washington. The nine neighboring counties of Oregon and the 15 nearest counties in Washington comprise the area from which most of the visitors originate. The towns located in this region include Pendleton, Hermiston, and Umatilla in Oregon, and Walla Walla and Tri-Cities area of Pasco, Kennewick, and Richland in Washington. Walla Walla's population in 1973 was approximately 24,000, and the population within the Tri-Cities area is now almost 150,000.

The dam is located adjacent to U. S. Highway 730, approximately 11 miles from its intersection with the Oregon Trail (U. S. Highway 80). Highway 80 is the most heavily used route for tourist travel from the east and west. Much of the eastern and western shore of Lake Wallula is not accessible due to high canyon-like cliffs.

Recreation areas

Project lands surrounding the lake are used largely for public recreation, wildlife conservation, and port development. The Corps of Engineers manages 13 of the 30 recreation areas on the lake; other recreation areas are state-, county-, and municipally-operated. Points of special interest at McNary Dam include the powerhouse gallery and control room window, the spillway observation point, navigation lock, and the fish viewing rooms.

Visitation

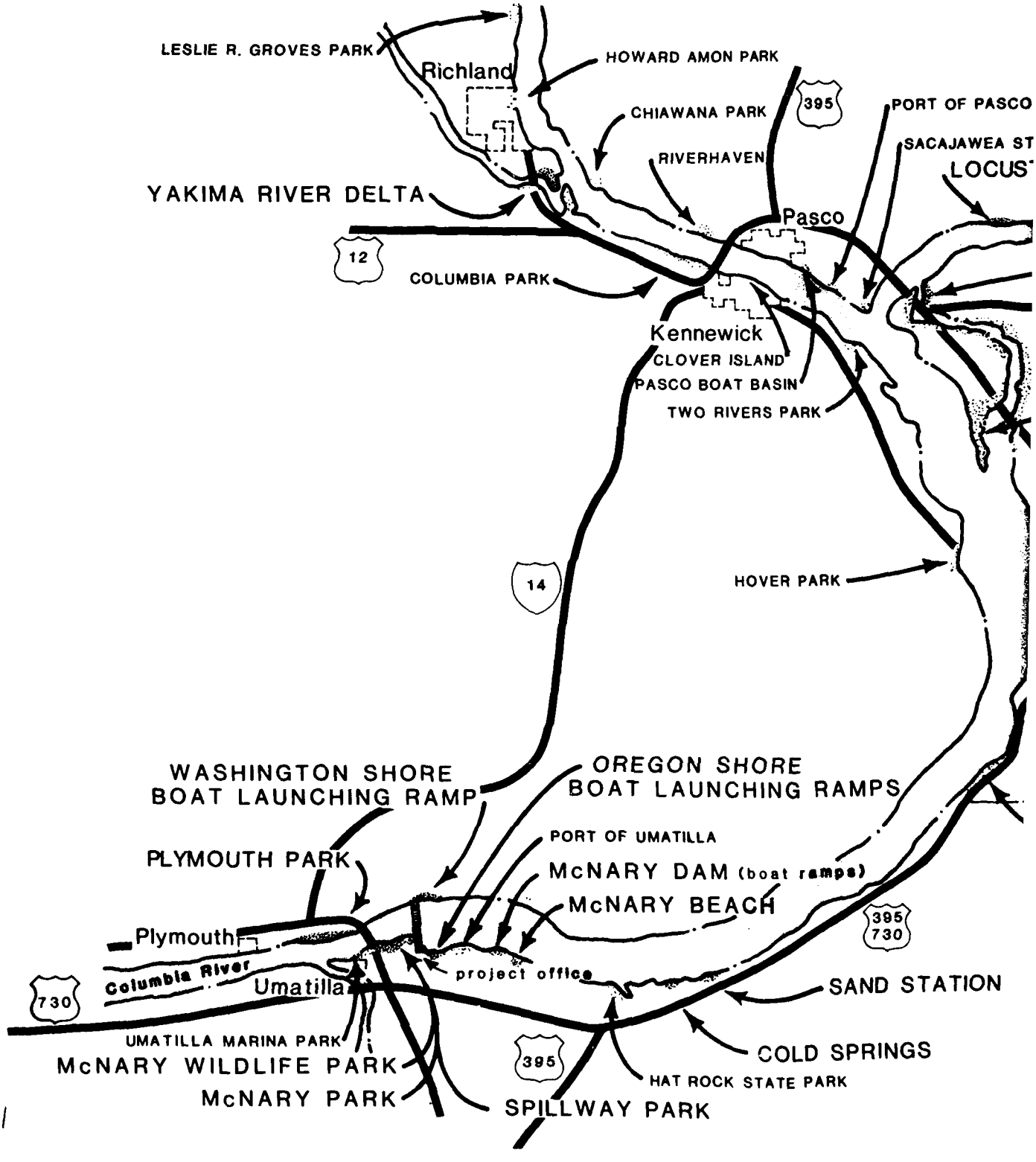
In 1978, 4,534,000 recreation days were recorded at Lake Wallula and McNary Dam; the 873,000 recreation days in July made this month the most popular time of the year to enjoy the varied resources.

In accordance with letter from DAEN-RDC, DAEN-ASI dated 22 July 1977, Subject: Facsimile Catalog Cards for Laboratory Technical Publications, a facsimile catalog card in Library of Congress MARC format is reproduced below.

Urban Research & Development Corporation.
Recreation carrying capacity facts and consideration; Report 6: McNary Lock and Dam, Lake Wallula Project Area / by Urban Research and Development Corporation, Bethlehem, Pa. Vicksburg, Miss. : U. S. Waterways Experiment Station ; Springfield, Va. : available from National Technical Information Service, 1980.
iv, 73, [25] p. : ill. ; 27 cm. (Miscellaneous paper - U. S. Army Engineer Waterways Experiment Station ; R-80-1, Report 6)
Prepared for Office, Chief of Engineers, U. S. Army, Washington, D. C., under Contract No. DACW39-78-C-0096.
Project map of McNary Lock and Dam, Lake Wallula, in pocket at end of report.

1. Carrying capacity. 2. McNary Project. 3. Monitoring. 4. Overcrowding. 5. Recreation. 6. Recreation resource planning. 7. Recreational areas. 8. Recreational facilities. 9. Utilization. I. United States. Army. Corps of Engineers. II. Series: United States. Waterways Experiment Station, Vicksburg, Miss. Miscellaneous paper ; R-80-1, Report 6.
TA7.W34m no.R-80-1 Report 6

McNary Lock and Dam - Lake



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RECREATION CARRYING CAPACITY FACTS AND CONSIDERATIONS. REPORT 6--ETC(U)
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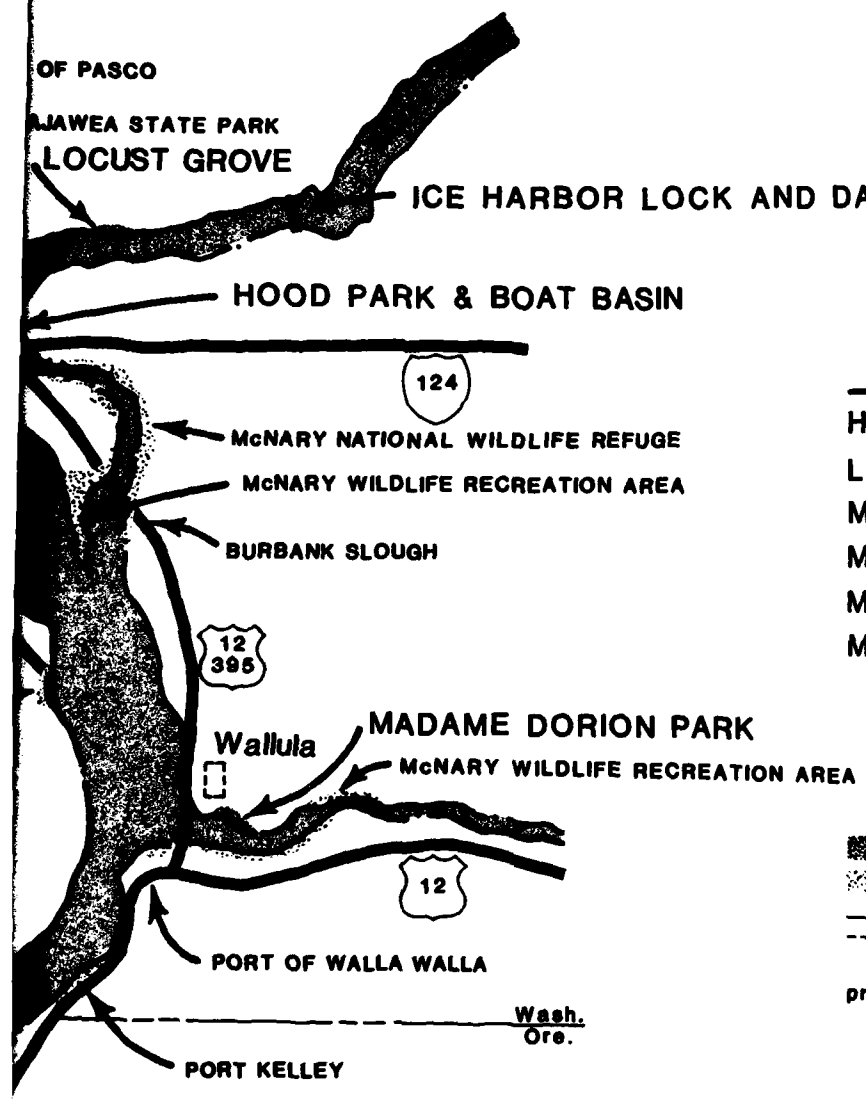

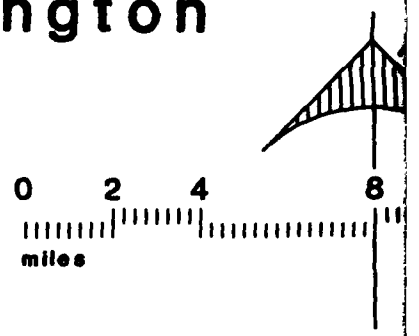

CORPS OF ENGINEERS RECREATION AREAS					
HOOD PARK	O	●	●		O
LAKE WALLULA	●				O
McNARY BEACH					
McNARY DAM (boat ramps)	O	●			O
McNARY WILDLIFE PARK					
MADAME DORION PARK			●		

O denotes activity offered in recr
● denotes interviews conducted

Corps recreation area
other recreation area
government-owned land
municipal boundary
dam
lake shoreline
highway
secondary road

prepared by Urban Research and Development Corporation - Bethl

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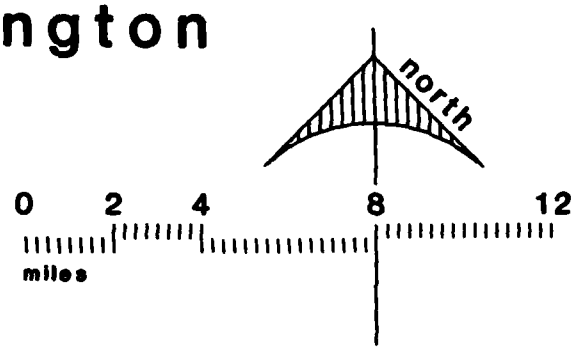

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	●				O					●
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mps)	O	●			O					O
PARK						●				
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tes activity offered in recreation area
tes interviews conducted in activity area

area	dam
area	lake shoreline
land	highway
y	secondary road

and Development Corporation – Bethlehem, Pa.


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